

NOTE . -

- ALL OUTGOING SW/FUSE RATINGS SHALL BE SAME
- TRANSFORMER RATING AND ZZ SHALL BE SO SELECTED THAT THE FAULT LEVEL SHALL BE WITHIN AVAILABLE MCB.

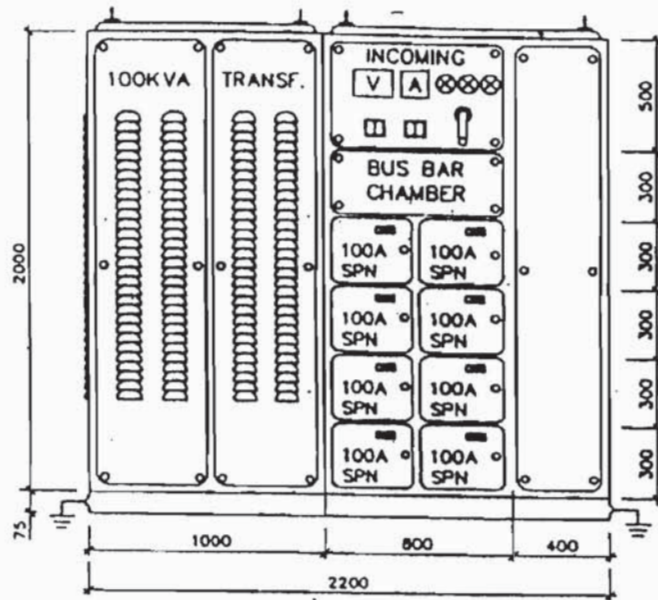


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PE-DG-277-558-0

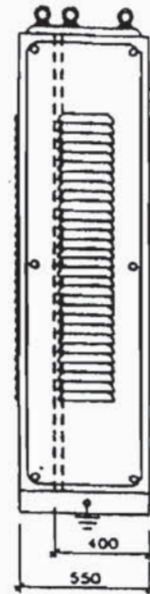
REV. No. 0

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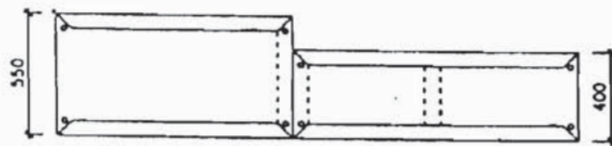
2951



FRONT VIEW



SIDE VIEW



FOUNDATION PLAN

GENERAL ARRANGEMENT : MAIN LIGHTING DISTRIBUTION BOARD



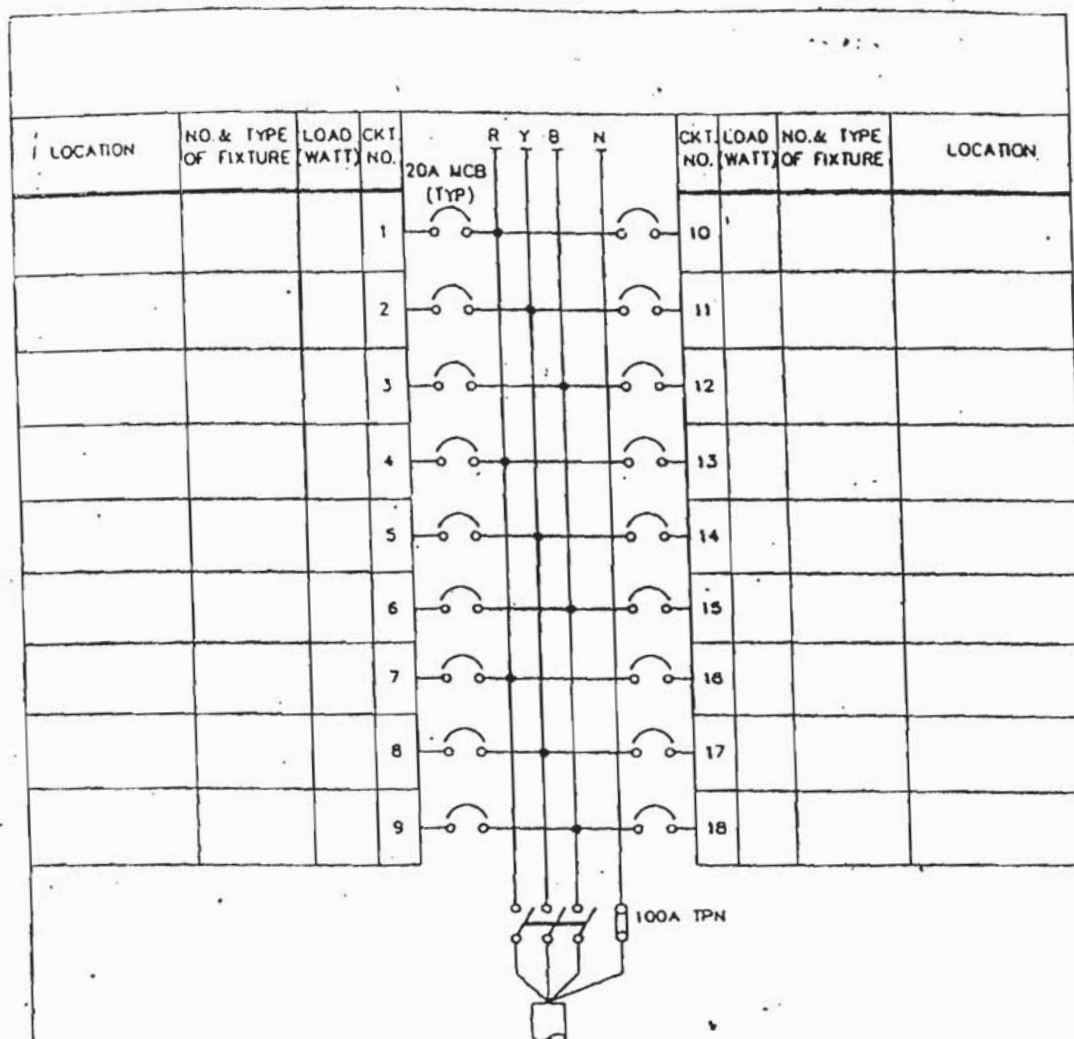
# LIGHTING NOTES & DETAILS

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3-LINE DIAGRAM : LIGHTING PANEL -



# LIGHTING NOTES & DETAILS

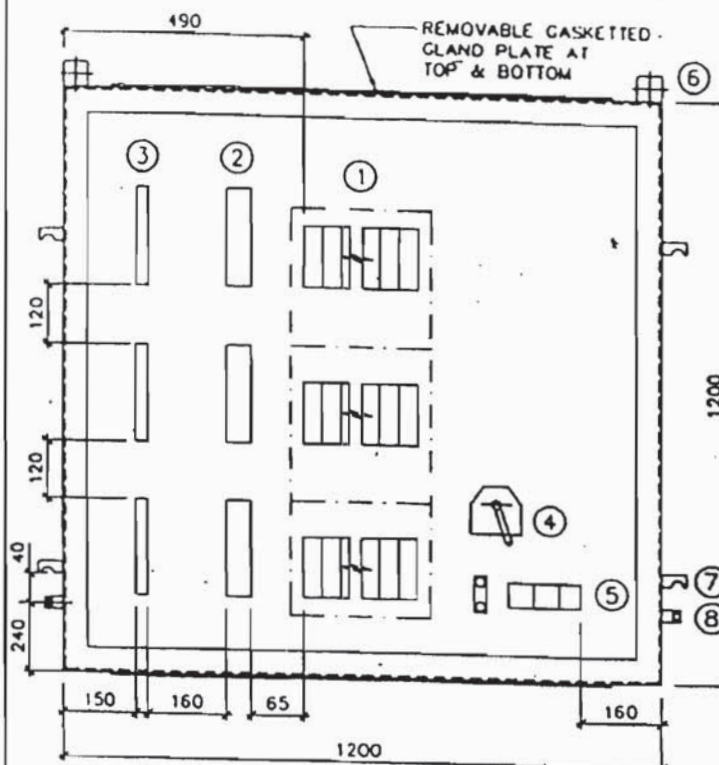
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REV. No. 0

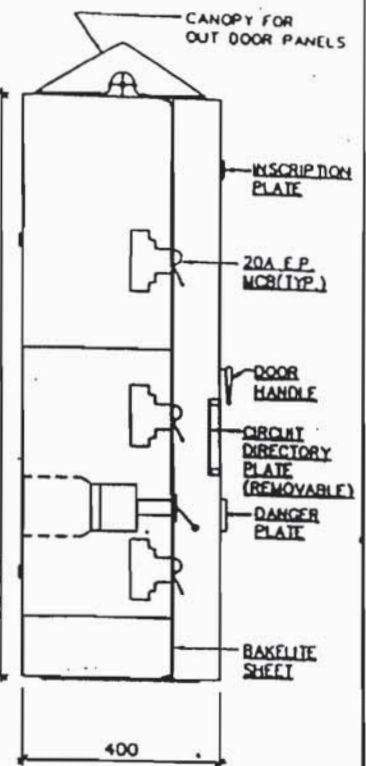
SHEET 7 OF 18

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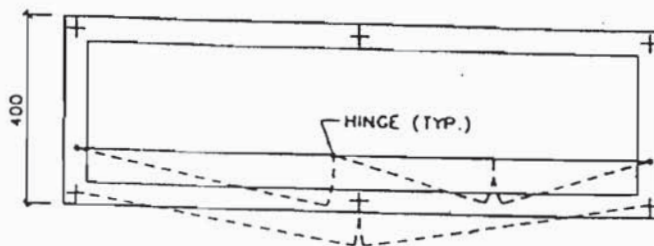
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FRONT VIEW  
(DOOR REMOVED)



SECTIONAL SIDE VIEW



FOUNDATION PLAN  
GENERAL ARRANGEMENT  
LIGHTING PANEL

LEGEND :

- ① MINIATURE CXT. BKR.
- ② PHASE TERMINALS STRIP
- ③ NEUTRAL BUS WITH NUT, BOLT & WASHER
- ④ ISOLATOR
- ⑤ TERMINAL BLOCK
- ⑥ LIFTING LUG
- ⑦ FIXING LUG
- ⑧ EARTHING STUD WITH NUTS



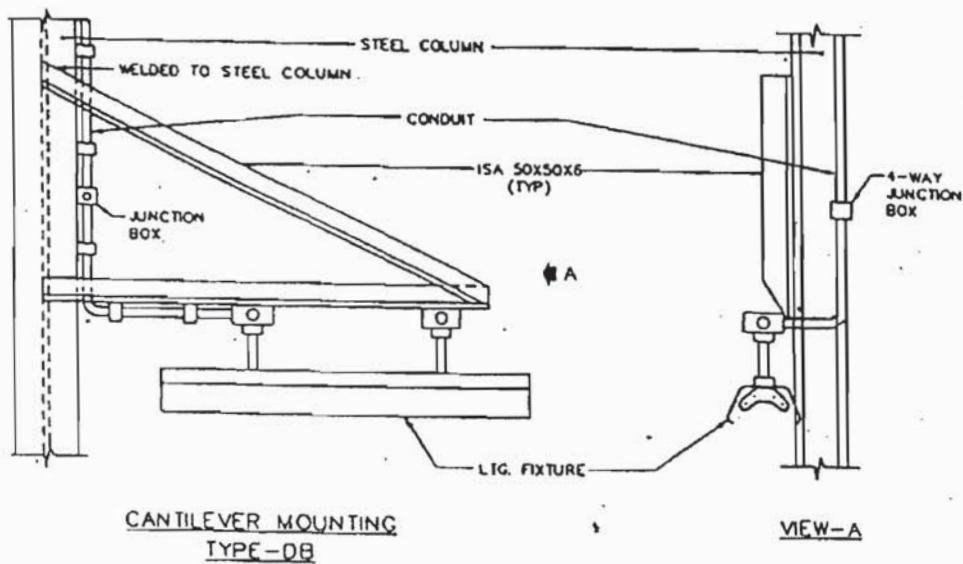
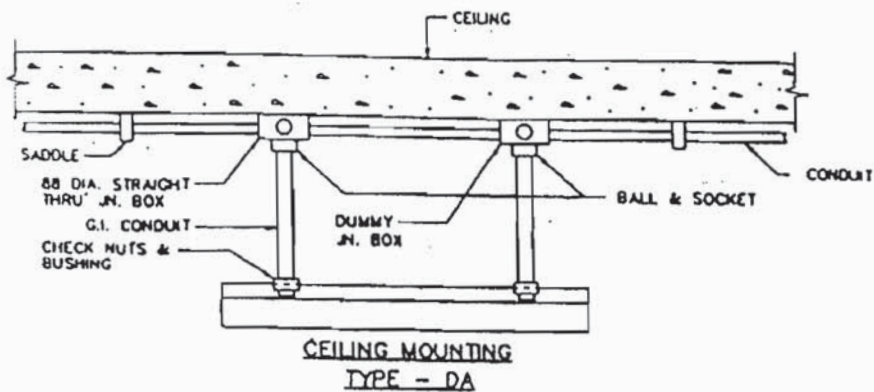
LIGHTING NOTES & DETAILS

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FIXTURE SIMILAR TO PHILIPS: TKC-24/236 OR EQUIV.  
WITH 2X36W FLUORESCENT LAMP SUITABLE FOR  
230V A.C.



# **LIGHTING NOTES & DETAILS**

DRG. No.  
PE-DG-277-558-00

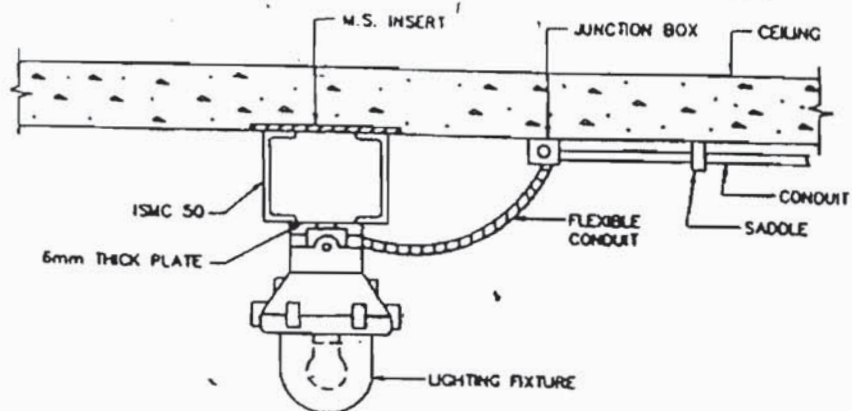
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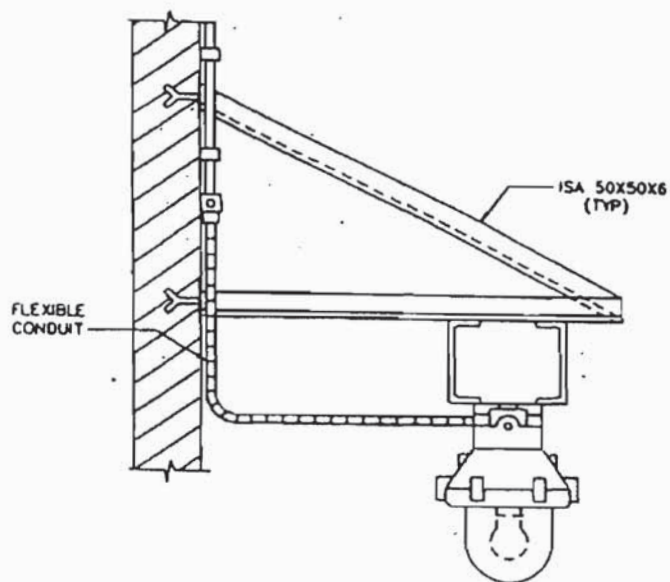
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150



CEILING MOUNTING



WALL MOUNTING

FIXTURE SIMILAR TO GENELEC. 65007 OR  
EQUIVALENT WITH 1X125W HP MV LAMP SUITABLE  
FOR 230V A.C. SUPPLY

NOTE:

WHEN USED WITH MV LAMPS  
THE CONTROL GEAR MUST BE  
HOUSED IN AN APPROVED  
FLAME PROOF ENCLOSURE OR  
ALTERNATELY LOCATED OUTSIDE  
THE DEFINED HAZARDOUS AREA.



LIGHTING NOTES & DETAILS

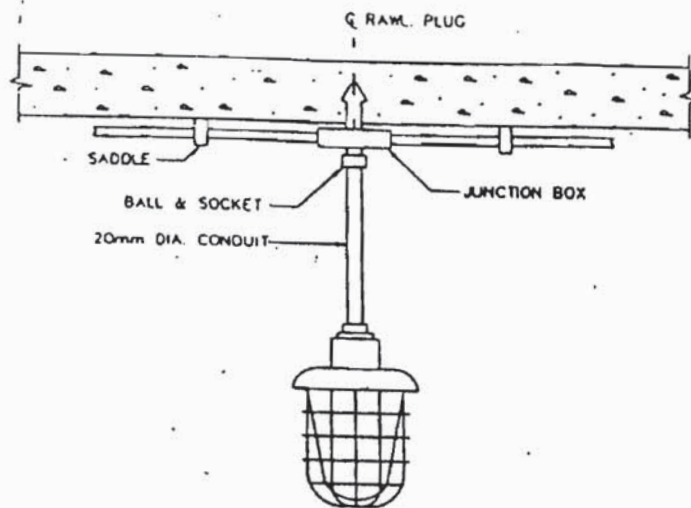
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REV. No.:  
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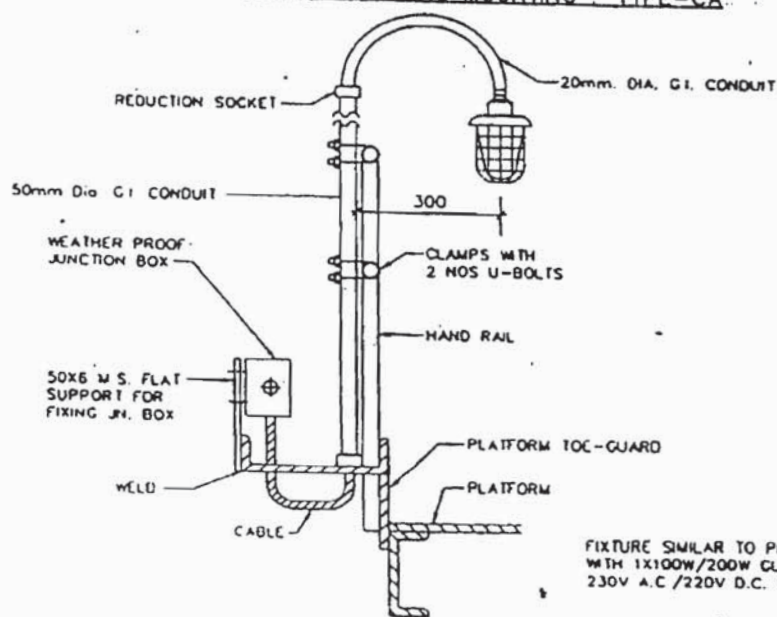
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FEA1



PENDANT/CEILING MOUNTING : TYPE-CA



FIXTURE SIMILAR TO PHILIPS: NDC22 OR EQUIV.  
WITH 1X100W/200W GLS LAMP SUITABLE FOR  
230V A.C / 220V D.C. SUPPLY

PLATFORM MOUNTING : TYPE-CB



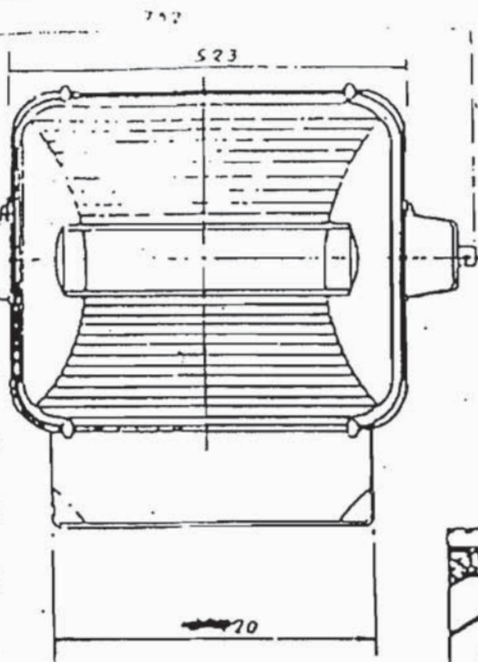
# LIGHTING NOTES & DETAILS

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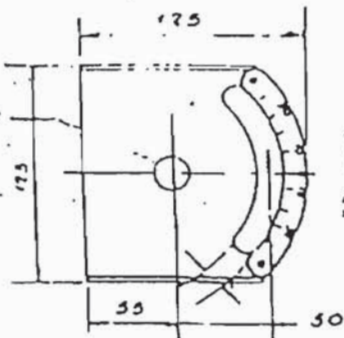
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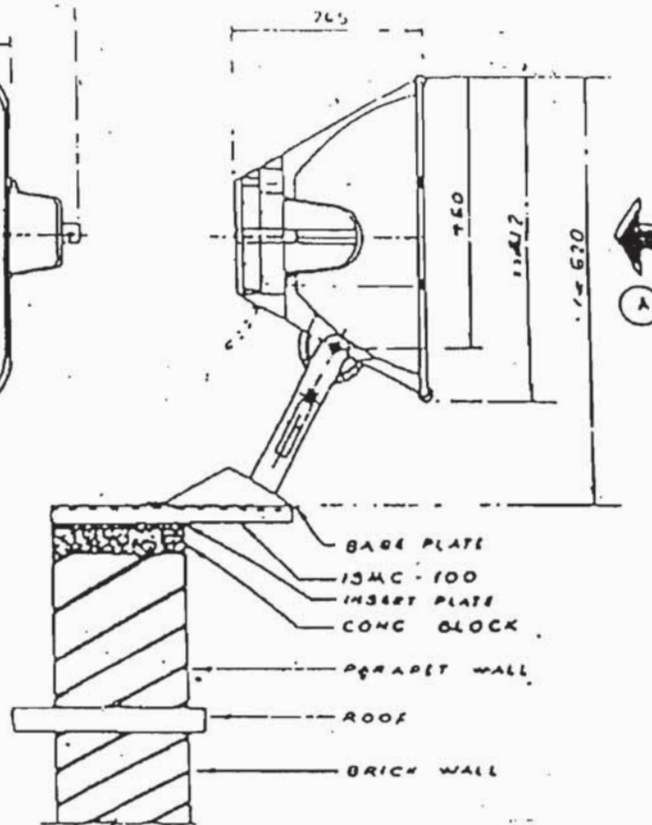
257



VIEW - A



BASE PLATE



TYPICAL MOUNTING ARRANGEMENT OF  
FLOOD LIGHT FIXTURE ON THE ROOF



LIGHTING NOTES & DETAILS

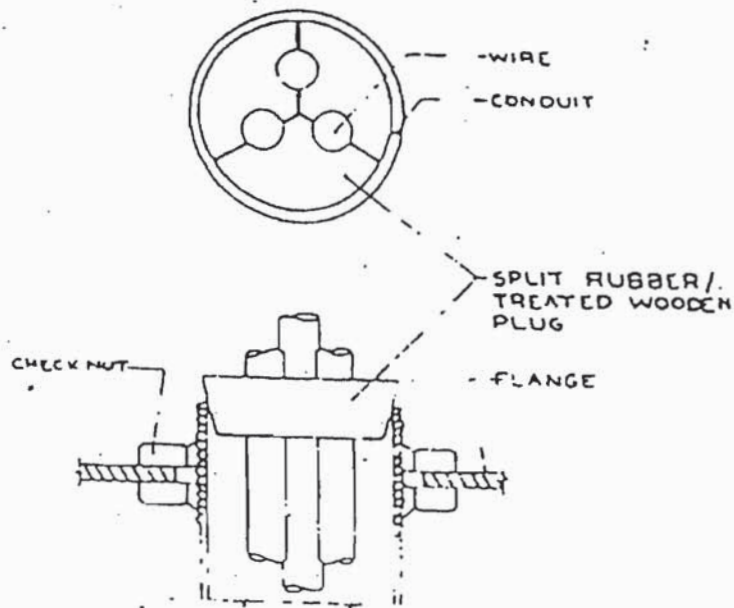
MOUNTING OF FLOOD LIGHT  
FIXTURE

DRG. No.  
PE-DG-277-558-0001

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CLAMPING OF WIRES  
IN CONDUIT VERTICAL RUN



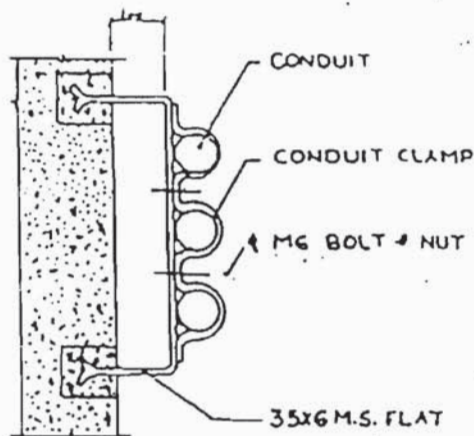
LIGHTING NOTES & DETAILS

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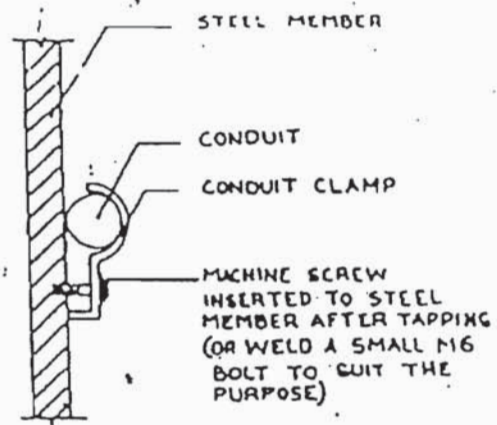
REV. No. 0

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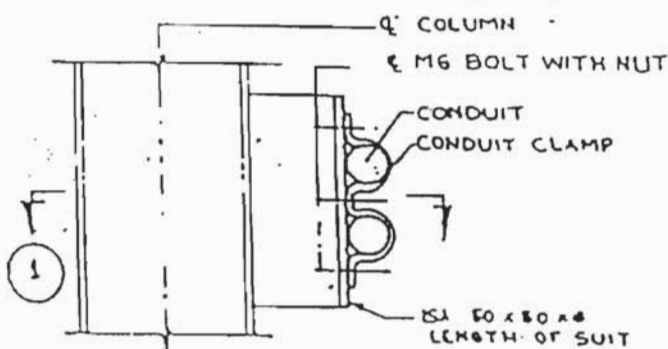
259



GROUP OF CONDUITS RUN  
ON CONCRETE SURFACE

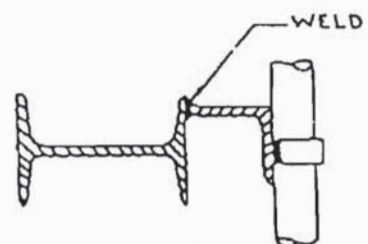


SINGLE CONDUIT RUN  
ON STEEL MEMBER



ELEVATION

GROUP OF CONDUIT RUN ON  
STEEL MEMBER ARRANGEMENT-A



SECTION — 1



LIGHTING NOTES & DETAILS

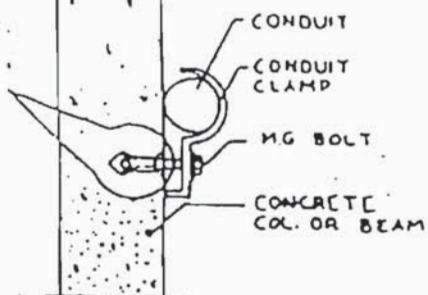
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REV. No.  
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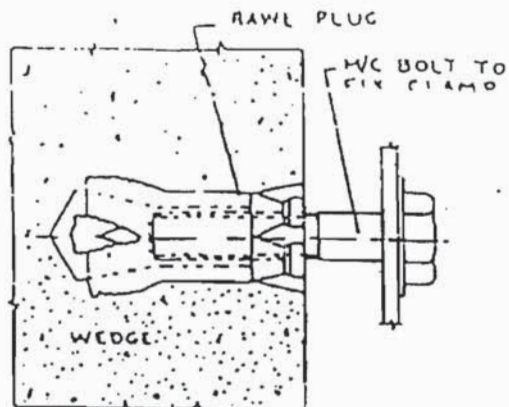
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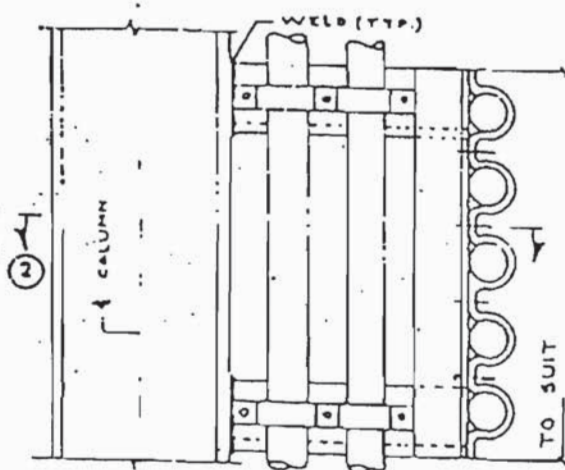
SEE  
DETAIL-A



SINGLE CONDUIT RUN  
ON CONCRETE SURFACE

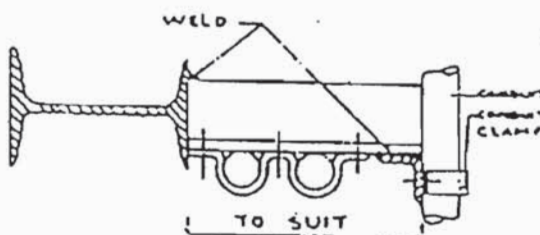


DETAIL-A



ELEVATION

GROUP OF CONDUIT RUN ON  
STEEL MEMBER ARRANGEMENT-B



SECTION-②



LIGHTING NOTES & DETAILS

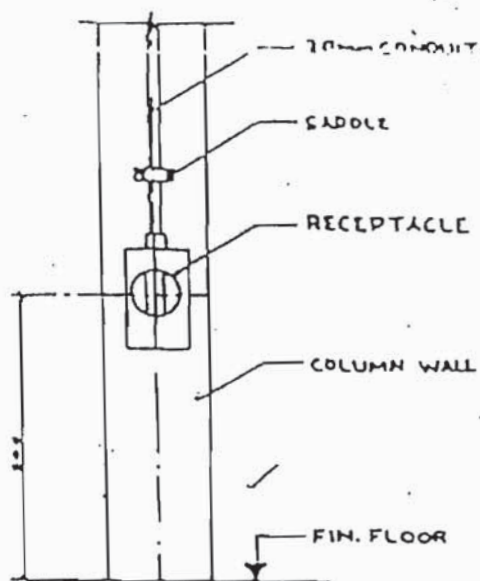
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PE-DG-277-558-000

REV. No. 0

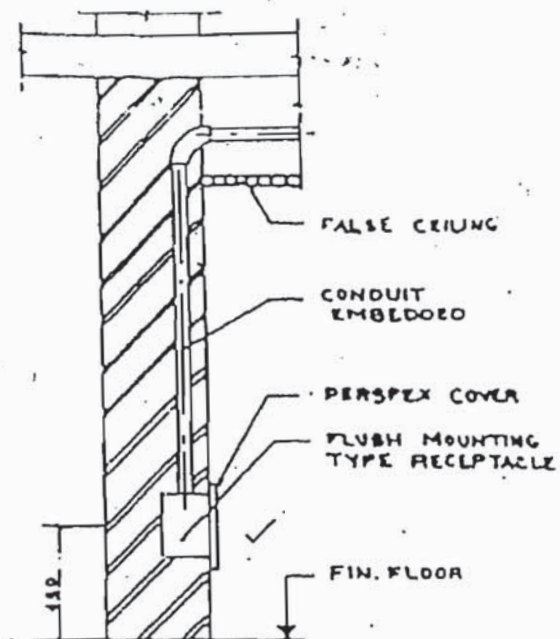
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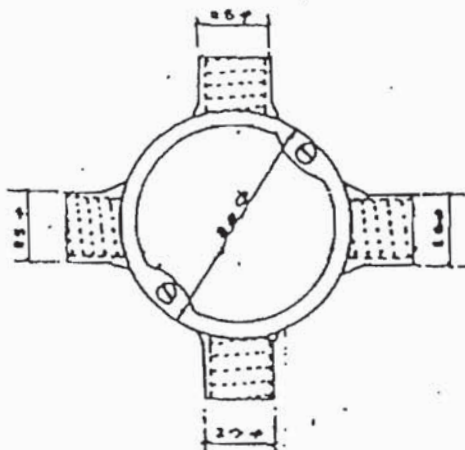
261.



RECEPTACLE - TYPE 'R<sub>B</sub>'  
(STRUCTURE MOUNTING)



RECEPTACLE - TYPE 'R<sub>A</sub>'  
(WALL MOUNTING)



JUNCTION BOX ROUND (TYP.)



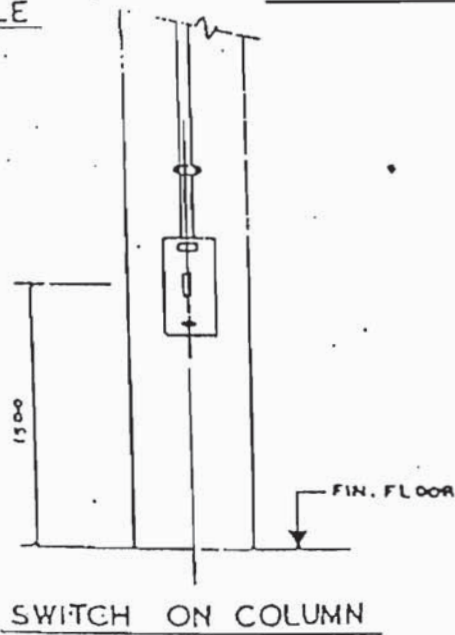
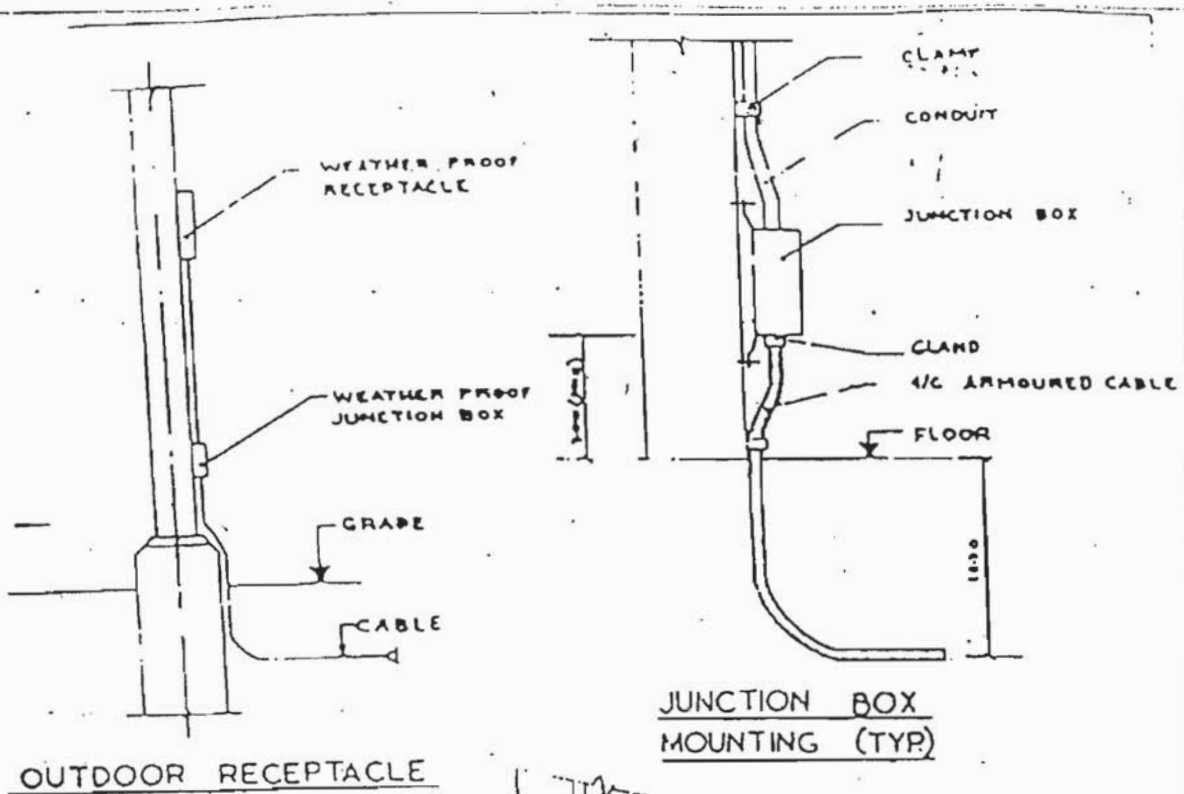
LIGHTING NOTES & DETAILS

DRG. No.  
PE-DG-277-558-0001

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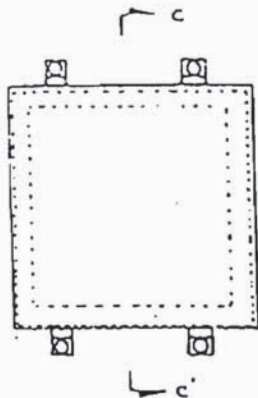
# LIGHTING NOTE & DETAILS

DRG. No.  
PE-DG-277-558-0001

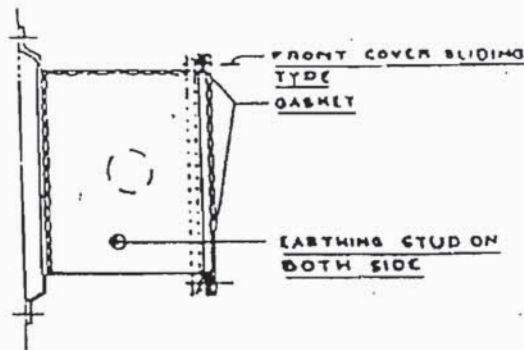
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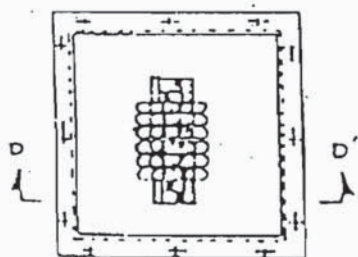
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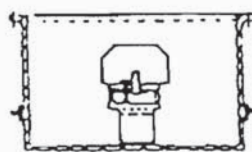
TYP. FIXING DETAIL  
OF JUNCTION BOX



SECTION: C-C'



JUNCTION BOX (TYP)  
FRONT VIEW



SECTION: D-D'



LIGHTING NOTES & DETAILS

DRG. No.  
PE-DG-~~277~~558-0001

REV. No.  
0

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LIGHTING  
FOR  
COOLING TOWER

SPECIFICATION NO.  
PES-558-02

VOLUME NO. : II

SECTION : D

REV NO. : 00 DATE : 20/04/07

SHEET : OF

COOLING TOWER AREA LIGHTING

SPECIFICATION NO: PES-558-02



LIGHTING  
FOR  
COOLING TOWER

SPECIFICATION NO.  
PES-558-02

VOLUME NO. : II

SECTION : D

REV NO. : 00 DATE : 20/04/07

SHEET : 1 OF 7

CONTENTS

- 1 General.
- 2 Codes & standards.
- 3 Design Requirements.
- 4 Painting
- 5 Testing & Inspection
- 6 Spare parts
- 7 Guaranteed performance requirement.
- 8 Drawing & Data
- 9 Operation and Maintenance Manual



LIGHTING  
FOR  
COOLING TOWER

SPECIFICATION NO.  
PES-558-02  
VOLUME NO. : II  
SECTION : D  
REV NO. : 00 DATE: 20/04/07  
SHEET : 2 OF 7

1.0 General

1.1 This specification covers the following:

- a) Engineering of Lighting system including the associated distribution system for cooling tower areas.
- b) Design, manufacture, supply, storage at site, testing of all necessary equipments such as lighting panel, lighting luminaires, lamps, sockets, wiring accessories and any other equipment and material as would be found necessary for the satisfactory execution/completion of the job.
- c) Erection, testing and commissioning of the lighting system for cooling towers.

2.0 Codes & Standards

2.1 Unless otherwise specified, the following codes standards are applicable. In all cases latest revision of codes shall be referred to.

Indian Standard

Title

|          |                                                                                       |
|----------|---------------------------------------------------------------------------------------|
| IS: 3045 | Code of practice for interior illumination.                                           |
| IS: 1513 | General safety requirements for electric lighting fitting.                            |
| IS: 3528 | Water proof electric lighting fittings.                                               |
| IS: 732  | Code of practice for electric wiring installation (system voltage not exceeding 650V) |
| IS: 1547 | Specification for flood lights                                                        |
| IS: 2163 | High pressure Mercury vapour lamp.                                                    |
| IS: 410  | Tungsten filament general service electric lamp.                                      |
| IS: 1293 | 3 pin plugs and socket outlets.                                                       |

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LIGHTING  
FOR  
COOLING TOWER

|                   |                |
|-------------------|----------------|
| SPECIFICATION NO. | PES-558-02     |
| VOLUME NO. :      | II             |
| SECTION :         | D              |
| REV NO. : 00      | DATE: 20/04/07 |
| SHEET :           | 3 OF 7         |

### 3 Design Requirement

#### 3.1 General

Lighting equipment and accessories shall be designed to operate satisfactorily under conditions specified in Data Sheet-A. The designed ambient temperature shall be as indicated in Data Sheet-A.

#### 3.2 Supply Voltage & Frequency

Details of the supply system shall be as specified in Data Sheet-A.

#### 3.3 Illumination Levels

The following are the minimum illumination levels to be achieved with the types of lighting fixtures specified against each area.

| Area                       | Illumination Level-lux | Type of fixture.                                                                                                                                                                                   |
|----------------------------|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cooling Tower Platform     | 100                    | Well glass weather proof lighting fixture with galvanised wire guard and equipped with 1x <sup>150W</sup> (125W) HPSV lamp mounted on suitable G.I. Pipe Bracket with adequate fixing arrangement. |
| Stairs                     | 70                     | Weather proof well glass fixture with galvanised wire guard and 1x 70W HPSV lamp.                                                                                                                  |
| Cooling Tower Surroundings | 3.0                    | Flood lighting fixture with 1x 250W HPSV lamp complete with all accessories including wall/Structure mounting bracket.                                                                             |

Bidders shall calculate number of fittings and furnish calculations for approval. Maintenance factor shall be taken as 0.7.

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LIGHTING  
FOR  
COOLING TOWER

SPECIFICATION NO.  
PES-558-02  
VOLUME NO. : II  
SECTION : D  
REV NO. : 00 DATE: 20/04/07  
SHEET : 4 OF 7

Lighting Panel

Lighting panel (L.P.) shall be totally enclosed, sheet steel, Indoor, outdoor vermin proof type. Sheet steel used shall be 2.0mm thick and be smooth and flawless. Hinged doors with gaskets shall be provided for access to the switches etc. The hinged door shall be interlocked with main switch.

The lighting panel shall be complete with aluminium busbars and shall incorporate IPW switch on the incoming side and single pole and neutral miniature circuit breaker having thermal and magnetic element for over load and short circuit protection on the outgoing. Suitable number of outgoing feeders with 20% spare circuits shall be provided.

The current rating of the busbars in lighting panel not less than the sum of maximum current rating of all outgoing circuits. The three phase & neutral panel shall be fitted with neutral busbar having facility for terminating as many neutral cables as single phase ways in the panels. Lighting panel shall be fitted with G.I. earth, stud located in an accessible position on the outside of the board. All metal parts of the panel except current carrying parts shall be bonded to the earth busbar. Lighting panel shall be fitted with phase barriers of fire proof insulating material fitted in such a manner that it is not readily possible for personnel to touch the phase busbar. Preferably insulation barriers shall be fitted around MCBS so that only surface and toggle of the breakers are available on the front. Panel shall be fitted with a card index of circuits on the inside of front cover.

The tenderer shall supply, erect and interconnect the lighting panel to the Lighting Distribution Board (LDB) located in the nearby pump house/building. The tenderer



LIGHTING  
FOR  
COOLING TOWER

SPECIFICATION NO.  
PES-558-02

VOLUME NO. : II

SECTION : D

REV NO. : 00 DATE : 20/04/07

SHEET : 5 OF 7

shall indicate the rating of incoming feeder from LDB shall lighting panel and provide the same. However LDB shall be supplied and erected by the purchaser.

3.5.15 A, 240V, Socket Outlets

15 A switched socket outlets (weather proof type) at every 5m interval shall be provide

3.6 Junction and socket boxes

These boxes to be provided in the cooling tower area shall be weather proof, made from 2mm thick galvanised sheet steel and shall incorporate terminal blocks for termination of incoming and outgoing cables.

3.7 Method of wiring

From lighting distribution board to lighting panel and from lighting panel to junction boxes in the cooling tower area a 650/110CV grade PVC insulated armoured and PVC sheathed cables shall be laid under ground as per relevant Indian Standard. From junction boxes in the cooling tower area to the lighting fittings/Socket outlets- PVC insulated and overall PVC sheathed cables shall be drawn in G.I. conduits.

The minimum conductor size for 15 A socket outlets shall be 4mm<sup>2</sup> single core cable depending upon

voltage drop consideration. The minimum acceptable conductor size for connecting lighting fittings to be provided on the platform/stairs shall be 2.5mm<sup>2</sup> single core cable or depending upon voltage drop consideration.

The minimum acceptable conductor size for connecting flood lights for illuminating surroundings shall be single core cable 2.5mm<sup>2</sup> or more depending upon voltage drop consideration.

Refer enclosed lighting notes & details (15 sheets) for wiring & installation. Cables, lighting panel etc. In case of conflict between clauses & Ltg. NOTES & DETAILS shall prevail.

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